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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/039,635	01/02/2002	Charles T. Black	YOR9-2001-0319-US1	9290
7590 07/11/2005 McGinn & Gibb, PLLC Suite 200 8321 Old Courthouse Road Vienna, VA 22182			EXAMINER JOHNSTON, PHILLIP A	
			ART UNIT 2881	PAPER NUMBER

DATE MAILED: 07/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/039,635	Applicant(s) BLACK ET AL.	
	Examiner Phillip A. Johnston	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18, 20-29, 31, 32 and 37-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18, 20-29, 31, 32 and 37-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

1. This Office Action is submitted in response to RCE / Amendment filed 5-6-2005, wherein claims 19,30, and 33-36 have been cancelled. Claims 1,6,10,24-28, and 37 have been amended. New claims 38-42 have been added. Claims 1-18,20-29,31,32, and 37-42 are pending.

Claims Rejection – 35 U.S.C. 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-13,16-18,20,24-28, and 37-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Pub. No. 2004/0131843 to Mirkin, and Mirkin, U.S. Patent Pub. No. 2002/0063212, in view of Cubicciotti, U.S. Patent No. 6,762,025. Mirkin (843) discloses the following;

(a) An apparatus and method for dip pen lithography where an SPM probe tip is coated with a pattern compound that includes a nanoparticle containing additive. The coating is applied by dipping the probe tip in a solution of the pattering compound, as recited in claims 1,2,10-13,20,24-27, and 37-42. See paragraphs [0015], [0053], and [0093];

(b) A variety of patterning compounds that include nanoparticles, as recited in claims 3,5, 6,38, and 42. See paragraphs [0056] – [0072], [0081] and [0089].

(c) The use of 13 and 20 nm nanoparticles, as recited in claim 4. See paragraphs [0109] and [0114].

(d) Forming a single row of 30nm nanoparticles, as recited in claims 7-9,16-18, and 38-42.

Mirkin (843) as applied above fails to teach the use of an adhesion layer, as recited in claims 1,6,24-28,37,38, and 42. However, Mirkin (212) discloses coating the SPM tip with an adhesion layer, as recited in claims 1,6,24-28,37,38, and 42. See paragraphs [0053] and [0054].

Therefore it would have been obvious to one of ordinary skill in the art that the nanolithography apparatus and method of Mirkin (843), can be modified to use the SPM tip coating of Mirkin (212), to provide an adhesion layer that will enhance the physisorption (adherence) of the patterning compounds to the tip.

It is implied herein that the use of nanoparticles in solution in accordance with Mirkin (843) and Mirkin (212) provides nanoparticles with an outer coating as recited in claims 1,4,5,10,24-28,32,37,38, and 42.

It is also implied herein that, the formation of a single row of nanoparticles using dip pen nanolithography in accordance with Mirkin (843) and Mirkin (212) includes attaching (affixing) a single layer coating of nanoparticles to the SPM tip, which is one nanoparticle thick, as well as attaching a single nanoparticle to the tip, equivalent to the limitations recited in claims 1,7-18,20,25-28, and 38-42.

Mirkin (843) and Mirkin (212) discloses the claimed invention except for having a specific value of length vs. width that is less than 15%, as recited in claims 1,10 and

24-28. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select a nanoparticle having a value of length vs. width that is less than 15%, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

The combination of Mirkin (843) and Mirkin (212) fails to teach the use of spherical nanoparticles, as recited in claims 1,10,24-28,37,38, and 42. However, Cubicciotti (025) discloses that, separation of the surfaces is achieved by template-directed attachment of an effector molecule; e.g., a nanosphere to a first surface. See Column 39, line 41-52.

Cubicciotti (025) also discloses that, proximity-based methods for single-molecule detection include proximal probe methods (e.g., AFM, STM) with reporter molecules (e.g., macromolecules, polymers or preferably nanoparticles or microparticles) to select and isolate one or more aptamers based upon a user-defined selection criterion or setpoint (e.g., target-binding affinity).

Single-molecule affinity selection can be achieved by immobilizing a target molecule to an SPM tip (i.e., negatively charged silicon nitride) used to probe a random-sequence, nanosphere-conjugated nucleic acid library. Scanning is performed in fluid mode to detect aptamer binding to the tip-immobilized target following application of the nucleic acid library sample to a freshly cleaved mica substrate, as recited in claims 1,10,24-28,37,38, and 42. See Column 157, line 46-67; and 158, line 1-10.

Therefore it would have been obvious to one of ordinary skill in the art that the nanolithography apparatus and method of Mirkin (843) and Mirkin (212), can be modified with the nanosphere's of Cubicciotti (025), to provide Single-molecule selection methods for identifying target-binding molecules from diverse sequence and shape libraries.

4. Claims 14, 15, 21-23, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Mirkin (843), Mirkin (212) and Cubicciotti (025) and in further in view of Colbert, U.S. Patent Pub. No. 2003/0106998.

The combination of Mirkin (843) and Mirkin (212) and Cubicciotti (025) fails to teach the use of cured and annealed adhesion layers on a probe tip; however, Colbert (998) discloses;

(a) The use of thin adhesive layers prior to coating the probe tip with nanoparticle solutions, and the use of UV and annealing as recited in claims 21-23. See paragraphs [0055]-[0058] and [0168].

(b) Dipping a probe tip into electrochemical solution and applying electrical potentials to the probe, as recited in claims 14, 15, 28 and 29. See paragraph [0034] and [0060].

Therefore it would have been obvious to one of ordinary skill in the art that the nanolithography apparatus and method of Mirkin (843), Mirkin (212) and Cubicciotti (025) can be modified to use the probe tip attachment methods of Colbert (998) to provide strong, reliably mounted probe tips thereby improving conventional microscopy techniques.

Conclusion

5. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (571) 272-2477. The fax phone number for the organization where the application or proceeding is assigned is 703 872 9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

June 29, 2005


JOHN R. LEE
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